Resources for research

AN INCREASINGLY IMPORTANT FACTOR for successful research and innovation, is the access to well-functioning research infrastructure. The research becomes more complex and dependent on different types of resources. Some of these are available at Uppsala University, others we gain access to through national and international collaborations. This ranges from major facilities to databases, libraries, biobanks, laboratories and data storage resources.

Long-term planning and intelligent funding strategies are required in order for the research infrastructure to maintain a high level of quality. In recent years, opportunities for external funding have declined. This means that a greater financial responsibility for local infrastructure lies with the actual institutions of higher education. We have therefore identified infrastructure as a strategic priority area for the University of Uppsala in the coming years.

Science for Life Laboratory (ScilfLab) is an excellent example of a large-scale collaboration where the research infrastructures play a significant role. It is a national centre for molecular biosciences aimed towards health and environmental research. The centre is a collaboration between Karolinska Institutet, the Royal Institute of Technology, Stockholm University and Uppsala University, where both technology and knowledge are to be used as a national resource.

Other examples of joint national initiatives, which give Swedish research new opportunities include: Max IV Lab and ESS in Lund. For a small country such as Sweden, it is important to participate in international projects that give our researchers the best conditions for high quality scientific work. Providing world-class infrastructures also contributes to increased mobility by attracting outstanding researchers from other countries, which creates attractive meeting places and creative environments. Factors, which in turn, have positive effects on the quality of research and to society in general.

Eva Åkesson, Vice-Chancellor

For a small country such as Sweden, it is important to participate in international projects that give our researchers the best conditions for high quality scientific work.

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New Horizons: E-Science

The flow of data is increasing

A FLOOD OF DATA STREAMS ACROSS THE WORLD. Environment and climate data, electrical particles, DNA sequences and genetic information… Not to mention patient data, statistics on unemployment benefit and sickness benefit. Even web services such as Facebook and search engines like Google are based on the data volume.

For research, it has meant that completely new issues can be studied and on a much greater scale than before. In this issue, we discuss some examples: research on glaciers, how computers can learn to understand language, the future of magnetic materials and cancer treatment.

To analyse all this data requires a wealth of computing power – both for data storage and to make calculations. In recent time resources have increased at Uppsala University, especially for researchers in biology and medicine.

With computer power researchers can investigate new questions, but also pick up old unresolved problems from the drawer. That’s according to Ingela Nyström who leads Esphere, a strategic research initiative on e-Science. This applies to many areas of research – perhaps the majority. “In the future, perhaps we will not talk about e-science, but about the ‘science’,” predicts Ingela Nyström.

New tools for large amounts of data.

More and more information is stored digitally and is available to many.

Fish show the way.

Game design in Visby.

Student of the year.

Meet honorary doctor Hans Rosling, who wants to show us our new world.
Large amounts of data REQUIRE NEW TOOLS

The amount of data has increased tremendously over the past ten years. More and more information is stored digitally and is available to many. At the same time, there is a need of tools to analyse all this data and create new knowledge. This is especially true within biology, where new technology has led to an explosion of data.

‘A COMPLETELY NEW working method has emerged over the past decade,’ says Ola Spjuth.

He is a researcher at Science for Life Laboratory (SciLifeLab) in Uppsala and leads the Uppnex project. They have built up large computing resources for what’s known as “next-generation sequencing” – i.e., large-scale gene analysis.

The technology makes it possible to quickly obtain the DNA sequence from samples from humans, plants and animals. It is useful in cancer research, pharmaceutical research and biology – and generates lots of data.

‘One run on a single sample can generate billions of bases (the letters A, T, C and G) and it’s not like reading a book, but takes days, weeks or in some instances months of calculations,’ says Ola Spjuth.

Suddenly, researchers were swimming in data. Hard drives were stacked up on the lab benches so a decision was made to make a joint effort to try to solve the problem.

Uppnex was already in place at Uppsala University, with high-performance computers that served researchers in fields such as physics and chemistry. In 2010 the server room was expanded with Uppparens for biological research. It is the part that has expanded the fastest and it’s still growing.

A NEW SERVER ROOM was recently opened at SciLifeLab, which is directly linked to Uppnex. All in all there is currently data from over 800 different projects and a storage capacity of 7 petabytes, which is equivalent to 7000 times more than what will fit on a typical hard drive.

Projects expand 5–10 times on the drives during the analyses and biologists like to save all their data. It’s a massive challenge to be able to scale up storage and analyses.

CONSEQUENTLY, developments place new demands on the research infrastructure. This concerns both the ability to store data and to analyse the information.

‘We will need to develop new methods and tools,’ says Ingela Nyström.

She is a professor at the department of Information Technology and coordinator of Essence, a national project. She sees research being able to answer completely new questions now that it’s possible to process larger amounts of data.

‘But also old problems, researchers will now be able to readress problems that were set aside ten years ago. If previously it was possible to study 100 molecules perhaps 1 million molecules were needed to get a realistic picture. Ten years ago this was not possible, but today we can do a lot more full-scale experiments.’

Essence assembles researchers who wish to improve their research with e-scientific methods. Strong research both in the field and in method development are required in order for this to work,’ says Ingela Nyström.

Ola Spjuth

He adds that they have invested a lot in support and training. Together with SciLifeLab, they offer a course where researchers have learned the basics of using large-scale computer systems and try to log in and use Uppparens.

‘It is usually overlooked. Very many research groups employ bioinformaticians now, but research leaders also need to understand how it works.’

Many projects are in progress for a long time. To map the genome of an organism, for example, is just a starting point for further studies. Ola Spjuth envisions that the data volume will continue to increase.

‘Projects are getting bigger and more people want to sequence. At the same time, the process is faster and we can get more and more data. Projects expand 5–10 times on the drives during the analyses and biologists like to save all their data. It’s a massive challenge to be able to scale up storage and analyses.’

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INGELA NYSTRÖM

Professor at the department of Information Technology

Ten years ago this was not possible, but today we can do a lot more full-scale experiments.
Large amounts of data require new tools

Today at Uppmax there is data from over 800 different projects and a storage capacity of 7 petabytes, which is equivalent to 7000 times more than what will fit on a typical hard drive.

Today researchers must keep up with developments. ‘We are trying to keep at the forefront with the methods we employ. If we do not have the latest software available, then Swedish researchers will automatically fall a half year behind those at the forefront of research,’ says Ola Spyth.

One of the experts in the field is Sverker Holmgren, professor at the department of Information Technology. He has researched computer-based tools and methods for some time and in recent years, needs have changed radically. Initially it was a question of smart calculations and simulations, now it is also about how large amounts of data are to be managed and analysed. They say ‘big data’ and the explosion of data from many different sources is a new challenge for IT researchers.

Computer simulations are an established activity, now we need to develop the analysis of data as well as how to store and manage data. This requires metadata that describes the data and that there is agreement on how data should be marked up. It’s a whole new world.

For example, computer support is needed to sort out what is relevant data and to quickly find significant information. As for calculations, it is a question of performing as much as possible in parallel and simultaneously keep track of the calculations so that any errors are kept under control.

The vision for Essence is to build a “toolbox” for researchers, which can be used to customise solutions according to the problem to be solved. And here, researchers can benefit from collaboration and sharing with each other.

‘If methods have been created that work for one problem, perhaps they’ll work on another,’ says Ingela Nyström.

One way to store large amounts of data is to do as Google and spread data across all computers. You can then send calculations to different places and calculate in parallel.

‘Within research it is not as easy to divide information as much is interrelated, for example within a chromosome, so it requires more advanced methods in order to be useful.’

Today researchers must keep up with developments. ‘We are trying to keep at the forefront with the methods we employ. If we do not have the latest software available, then Swedish researchers will automatically fall a half year behind those at the forefront of research,’ says Ola Spyth.

The actual base, research infrastructure, is the same in different disciplines, but requires each research field to be developed with its own methods and tools.

‘The hard drives and the computers are the same, but the further you move up, the more specific different areas become. In the next few years we will need to develop a completely new type of tool, and this will demand more than a short-term approach.’

THESE THOUGHTS are also shared by Ola Spyth at SciLifeLab. He has researched the future of biological research and what is required to keep up with developments.

‘Biologists require much more storage space than traditional users. They frequently work with a large number of smaller sub-problems that require a great deal of primary storage to process. They are also more impatient, while physicists are accustomed to the time it takes, biologists want it to go faster.’

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SVERKER HOLMGREN
Professor at the department of Information Technology

COMPUTER RESOURCES AT UPPSALA

UPPMAX (Uppsala Multidisciplinary Center for Advanced Computational Science) is Uppsala University’s resource for high performance computing, large-scale storage and expertise in high performance computer usage. Established in 2003 as one of six centres within the national infrastructure SNIC (Swedish National Infrastructure for Computing), which Uppsala University heads.

UPPmaxnext generation sequencing Cluster & Storage hosts.

UPPNEX stands for “UPPmax Nexus generating Cluster & Storage”, and is a project at UPPMAX, which offers computation and storage resources as a national resource within the next-generation sequencing (NGS), primarily within Science for Life Laboratory (SciLifeLab).

e-SENCE is a strategic research programme in e-Science that is run in a collaboration between Uppsala University, Lund University and Umeå University. e-SENCE was instead by the government to support research that was strategically important for society and industry. The vision is to lift Swedish e-Science to the highest international level, by building a creative research environment where new tools and applications are developed. e-SENCE also interacts with industry.
Computers calculate how the glaciers move

In order to understand how glaciers move it is important to understand how they are affected by global warming. Today’s technology allows researchers to both access and use much more data than before. However, this demands computer power to calculate and run models.

INCREASED GLOBAL temperature means not only that the earth’s glaciers are melting faster. It also means that those that run out into estuaries will slide out faster. This in turn affects melting as the underside of the glaciers comes into contact with water, which is relatively warm.

The research teams that professor Veijo Pohjola is active in is investigating the process when glaciers slide over bedrock. His research area is Svalbard.

‘As global warming continues, it becomes increasingly important to take the temperature of glaciers that are changing.’

The work is performed, among others, under Svali, a Nordic research centre studying the climate environment and energy issues.

The development of technology has changed the basis of glacier research.

‘In the beginning of your career you travelled around and took measurements on a glacier with an instrument and performed an analysis. Now we gather a great deal more information and conduct advanced data processing that requires smart algorithms. Today you need to pair climate models, an ice flow model, balance models and databases of elevation models.’

THE RESEARCHERS model how a glacier moves in order to predict how it will move in the future; run the model and compare with the data they collect in the field. Input data is the gravitational field from the glacier, which gives a picture of the mass distribution, how the glacier surface moves and changes, the energy flow in the glacier and precipitation.

It is running the models that demands substantial computing power. This applies in particular to the ice flow measurements. They must be repeated many times with slightly different parameters. Frequently this is done in several steps, where researchers use the results from previous runs to improve the input of the next. This creates large amounts of data that must be analysed.

The fact that we can perform more accurate analysis today, is obviously positive. We get better results. But it also becomes extremely complicated, so it’s not always so easy to understand the results,’ says Veijo Pohjola and laughs.

VEIJO POHJOLA and his research group collaborate with many Swedish and international teams. Data exchange is an integral part of the research.

‘The sphere we work in is quite small and most people know each other, which means that you trust that you will be invited as an author if the work leads to a publishable result. But if you do not know the people, it may advisable to enter into an agreement about how data can be used.’

Svali, a Nordic research centre studying the climate environment and energy issues.

Language is difficult for Google’s computers

Computers that can speak like humans have existed for some time in science fiction literature. Yet in reality, it has proved difficult to get computers to understand the nuances of language. Joakim Nivre is a professor of computational linguistics and researches teaching computers to improve their understanding of language.

KIM BERGSTROM PHOTO: PRIVAT

Joakim Nivre, professor of computational linguistics, has been researching a method of teaching computers grammar.

Language is difficult for Google’s computers. Of course it is important to have sufficiently fast algorithms. If you take the software that has the world record for accurate analysis of English, it would take 300 years to analyse the entire Web on a computer. ‘That’s what I’m working on – to produce sufficiently fast software without losing too much accuracy.’

There is a great deal of irony in grammatical analysis. It is one of the most data and computer intensive areas. However, first and foremost it is neither storage space nor processing power that is biggest bottleneck.

‘In order for the software to learn to understand the texts, we first need to feed them with example sentences marked with a grammatical analysis. So people need to sit and mark up a sufficient amount of text.’

Joakim Nivre mainly teaches computers to explore the component parts of a sentence. He has recently been working at Google to help the company to develop improved language analysis software.

‘The methods they use are largely based on example sentences marked with a grammatical analysis. They are called question-answering systems. We take a sentence and for each word we determine the possible part of speech in the sentence and how it can be combined with other words in the sentence to form a complete sentence.’

 ‘When asking someone “who bought Nokia?” it is not enough that the computer can find Nokia. It has to be given that Nokia is the object. It needs to determine which part of speech the object is.’

NOWADAYS almost all searchable texts have undergone a grammatical analysis. ‘Google, for example, has its own copy of the web, which is updated daily. Information is stored about the context of each page, which words occur, facts are extracted and relationships mapped. Search questions and what people click on are accumulated and matched.’

Making a linguistic analysis of the entire web involves managing incredible amounts of data.

Joakim Nivre, professor of computational linguistics, has been researching a method of teaching computers grammar.
Millions of images of cancer

No cancers are alike and different people need different treatment. Studying images of how cancer cells respond to different substances increases our knowledge of how to combat the glioblastoma brain tumour.

Different patients respond differently to different treatments and the treatments themselves often cause a great deal of suffering. By testing different pharmaceuticals on cultured cells, we hope to better understand the differences between different patients, says Carolina Wählby.

She is a researcher in image analysis and collaborates with cancer researchers, pharmaceutical researchers, cell biologists and biostatisticians in a newly started project. Together they have examined the glioblastoma brain tumour, which makes up to three per cent of all cancers and is a very heterogeneous cancer type.

“We use image analysis to quickly measure how the cells react to a broad range of treatments. For each patient, we test approximately 2500 different pharmaceuticals and doses in parallel and work with about a million images, something that requires a plethora of computing power.”

Researchers use biopsies of tumours and cultivate the cells in a 384-well microarray plate. There are robotic systems that can discharge small molecules, either known pharmaceuticals or potential pharmaceuticals, in the small wells. They are then photographed with an automated microscope.

All these images are then run on the computers at Uppmax.

If someone should analyse the images by hand, it would take several lifetimes, while a computer cluster can do it in a few hours. And you can always go back and look at the images where the computer indicates that something interesting has happened, says Carolina Wählby.

In addition to the images, the researchers have access to patient information, and how they have responded to different treatments. Thus, together with the genetic and molecular analysis, we are coupled to how the cultured cells react to different pharmaceutical substances.

“Two people never have exactly the same cancer, but you can still group the variants. The hope is to be able to better understand the different cancer variants, but in the long term, it would be fantastic if we can use this to find new effective treatments and decide which treatment would be most suitable for each patient,” says Carolina Wählby.

“Often it is the treatment that is so incredibly stressful, if you can choose the right treatment from the outset you save both time and suffering.”

To process all the material requires processing power not only means that larger systems can be studied, it also means that the studies are more accurate.

There are several advantages in studying the variation between patients on the cultured cells. Partly it is easier from an ethical aspect to test pharmaceuticals on cellular level outside the human body. Partly it is easier from an ethical aspect to test pharmaceuticals on cellular level outside the human body. In part you can test a large number of substances on the same patient, which otherwise would have been an impossibility.

“But you have to remember that these cultured cells are a model of what is happening inside the body and that the cells are in a completely different environment than the human body. You must always bear in mind that this is a vast simplification of what is really happening, but it can put us on the right track.”

For each patient, we test approximately 2500 different pharmaceuticals and doses in parallel,” says Carolina Wählby. It requires plenty of computing power.

Although the researchers have access to patient information, and how they have responded to different treatments, they think shown an interesting change and ask the computer to find similar cells. Are there additional patients that follow the same pattern?

“It’s not as if we only use computer analysis, we constantly try to incorporate knowledge from the medical researcher or cell biologist and utilise this knowledge, so that we maximise the knowledge of all those involved,” says Carolina Wählby.

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There are many applications, for example within data storage. Most hard drives are made from magnetic materials and can be made smaller, faster and more energy efficient,” says researcher Anders Bergman.

The simulations and calculations require a lot of processing power as the researchers are studying great systems of millions of atoms. The research team is therefore using computer clusters at Uppmax. More processing power not only means that larger systems can be studied, it also means that the studies are more accurate.

“We have a nice base for theorising in Sweden, where we have a robust infrastructure of supercomputers on which to run advanced calculations. This infrastructure is very important to us and other theorists,” says Olle Eriksson.

A project is currently being carried out to test these theories in practice, in collaboration with KTH and the University of Gothenburg. The project is led by Olle Eriksson.

“We have made some headway as we have worked on this on a theoretical level for a few years. Now we can also create an experimental environment where we hope to verify our theories,” says Olle Eriksson.
Genetic risk

Using today’s technology, human DNA can be collected and mapped to a very large extent. Vast amounts of money are being invested in genome studies and surveys of biomarkers to give information about disease processes, but also on how we respond to different types of medical treatment.

You build up large knowledge bases, and with the help of technology, produce more information than perhaps we are equipped to handle. Researchers do not always think about how they should communicate the information,” says Mats G. Hansson, Professor of Biomedical Ethics and director of the Centre for Research Ethics and Bioethics at Uppsala University.

One example of the problems we face is if a sample that we left at a biobank is found to indicate that we carry a genetic marker, which, depending on a number of factors, could result in cancer. How do we want the doctor or researcher to act in this case?

If when leaving normal samples at the doctor it is revealed that we carry genetic information that can cause cancer, we would probably be informed of the test result so that we can prevent or cure the disease. Yet if the result is only an indication, depending on a variety of interacting factors, it is no longer obvious that we want to know what’s going on, or that we understand the information we receive.

“Risk information after a genetic test can both give false positive and false negative results,” says Professor Mats G. Hansson. “We intended to look at how patients have understood and reacted to this type of information and risk.”

“In principle there is no research into genetic risk and how it should be communicated to the individual, and it was here that the idea for Mind the Risk project was born. The working group includes researchers from a variety of disciplines: psychologists, philosophers, health economists and clinicians. Together, during the first two years, they will work with concepts such as genetic information and risk.”

“We intended to look at how patients have understood and reacted to this type of information. We also hope to develop a new method that takes into account how our decision-making appears. The ultimate goal is to develop concrete tools for both those who deliver and those who receive risk information,” says Mats G. Hansson.

How’s it going for Sweden? Ulf P. Lundgren was asked this question in a live radio interview on the same day as the result of the international student assessment PISA was published in December last year.

He had a hunch that the result would be bad, but did not want to sound too negative. “So instead I said: I do not know.” It then turned out that not only was the result for Swedish 15-year-olds bad, it was much worse than expected,” says Ulf P. Lundgren, Professor Emeritus at Uppsala University, who in the 1990s was a part of the team that devised OECD’s international knowledge test PISA, Programme for International Student Assessment.

The assessment, which tests 15 year olds in mathematics, reading and natural sciences, is held every three years and is comparable over time and between countries.

According to the latest assessment, the performance of Swedish students who have deteriorated compared to 2009 and for the first time, they performed below the OECD average in all areas. Furthermore, the results seen over time have also deteriorated the most compared to all other participating OECD countries.

This is a disturbing trend that is confirmed not only in reading but also in mathematics, where the result for Swedish 15-year-olds is below the EU and OECD average, the Swedish results have continuously deteriorated since the 2000s.

It is difficult to discover the exact causes of the development. One clue is what actually happens in the classroom. In a recently completed research project, Caroline Liberg and her colleagues have studied the PIRLS reading test, which not only examines students’ knowledge, but also includes surveys to include teachers.

“It turns out that Sweden is one of the countries with the smallest element of text dialogue in their schools,” says Caroline Liberg, Professor of Educational Sciences at Uppsala University.

In her research, she has studied another international test in detail: PIRLS, Progress in International Reading Literacy Study. Here it is the reading comprehension of 10 year olds that is studied and the latest result from 2011 is not pleasant reading either. Even if the Swedish 10 year olds are above the EU and OECD average, the Swedish results have continuously deteriorated since the 2000s.
between teacher and student. Swedish teachers are well below the OECD average in terms of spending time on teaching that gives students the means to absorb the text content. Instead, pupils are left to themselves for quiet reading,’ says Caroline Liberg.

The result development in schools also has to do with a changing world. For example, 1980’s school choice and free-school reforms.

‘School choice has led to more homogeneous groups of pupils. Some schools have homogeneous strong students who challenge each other to good results and who also have strong support from home. Other schools have homogeneous weaker groups of pupils who lack role models in school and at home. This problematic trend has been highlighted, among others, in the PISA assessments,’ says Caroline Liberg.

THE DECLINING NUMBER

Applying to teacher training is another external factor that cannot be ignored. Initially it was mainly the smaller colleges that recruited students with little prior knowledge, but now it is also the major universities. ‘In essence, we get more and more student teachers with poorer prior knowledge,’ says Caroline Liberg.

She graduated from teacher training in the early 1970’s – a time when the education required high admission credits and the profession had a different look. Teachers could then spend all their time on teaching and planning. Today, a primary school teacher, according to a report from the Swedish National Agency for Education, spends on average 34 per cent of their work time on education, 10 per cent on planning and as much to assess and document student development. Feedback on student knowledge development to students and parents takes 3 per cent of the time and administration and practical work approximately 13 per cent.

Another change compared to the past is that a number of national tests must be sat in years 3, 6 and 9, and at secondary level.

The school question is expected to be one of the most important issues prior to the 2014 election and the political parties are positioning themselves. The reaction tires Professor Ulf P. Lundgren, who researches in the field of education policy.

‘It is not a particular reform, initiative or reason behind the development. The policy has created a slippery slope for the Swedish school system that depends on many factors. It is naive to believe otherwise.’

According to him, there is a risk that assessments such as PISA, ill-judged, could be counterproductive for a country’s education system.

‘Political hullabaloo and ill-conceived new reforms only lead us to continue to undermine the school,’ says Ulf P. Lundgren, whose advice to the political parties is to put down the battle-axes in the school question.

Inspiration can be taken from our neighbour Finland – who ranks highly in international tests such as PISA and where there is a clear agreement on collaboration across party lines in education matters.

Moreover, they have a proud tradition surrounding the teaching profession that historically dates back to the Russian days when the schoolmaster was the one who carried the Finnish language and Finnish culture forward. Ulf P. Lundgren quotes one of his Finnish research colleagues: ‘In Finland, we trust our teachers. In Sweden you distrust them. That’s the difference.’
Positive trend for world peace – except in new democracies

The number of armed conflicts around the world will continue to decline. At least according to Håvard Hegre, new professor of peace and conflict studies at Uppsala. His forecast for the next 40 years shows several positive trends that will strengthen peace.

IN NOVEMBER last year, Håvard Hegre took over the Dag Hammarskjöld Professorship in Uppsala after Peter Wallansteen. He came directly from Oslo – from the Peace Research Institute Oslo (PRIO) and the University of Oslo – where he previously in same year presented his forecast for peace and conflicts in the world, which was made in collaboration with Uppsala University.

The forecast gives an optimistic picture: In the long-term, the number of conflicts will continue to decline. The reduction in world poverty is one of the most important factors in our model,”

ANOTHER FACTOR is the so-called ‘conflict trap’. The longer there has been peace in a country, the less chance of war. ‘Conflicts beget conflicts and peace fosters peace. Five years after a conflict, the risk of a new conflict is five times greater than before the conflict. Every year of peace makes a difference,’ says Håvard Hegre.

A positive trend can also be seen here. In 2012, the world’s countries had on average had 42 years of peace, as compared with the average in 1960 of 27 years.

‘As we have experienced a trend of decreasing conflicts over the past 20 years, we can be optimistic about the next 40 years.’

Another important factor that affect peace is that attitudes to violence and conflict have changed, says Håvard Hegre.

‘The war between the USA and Vietnam would not have been possible today. It was only 40 years ago, but since then there has been a dramatic change in our attitude towards the use of violence.’

However, another kind of conflict, which could not be predicted by the model developed by researchers, is increasing: In countries such as Syria and Libya where demands for democratisation create violent conflicts.

‘We need to build democratisation into our model to be able to provide a better prognosis. This means that we must be able to predict changes in political systems in the coming years, which increases the complexity.’

FACTORS THAT AFFECT PEACE

• Fighting poverty and education (fewer conflicts)
• Democratisation and division of states (initially more conflicts)
• UN peacekeeping operations (fewer conflicts)
• Democratisation (initially more, but in the long term fewer conflicts)
• Growing population (more conflicts in large populations, but fewer conflicts per capita)

As we have experienced a trend of decreasing conflicts over the past 20 years, you can be optimistic about the next 40 years.

The reduction in world poverty is one of the positive trends that Håvard Hegre highlights in his research.

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Why do Europeans tolerate milk?

EUROPEANS TOLERATE MILK to a far greater extent than people in other parts of the world and the reason for this has yet to be fully uncovered. A study by, among others, Oddny Sverrisdóttir at EBC has taken a step closer to answering the question. By studying the DNA of early Iberian farmers, researchers have shown that the hypothesis that milk was important for the calcium absorption of our ancestors may not have been the only explanation. It may also have been the case that starvation led to periods of very strong selection in favour of those people who could digest lactose.

NEW RESEARCH from Uppsala University shows that in healthy young men it’s possible to measure, after one night of sleep deprivation, the same elevated concentration of substances in the blood as after acute sleep deprivation. The results indicate that a good night’s sleep can help the brain stay healthy. The researchers have together examined whether an acute lack of sleep affects morning values of two cell substances whose concentrations of NSE and S-100B. Blood samples were taken from 15 men of normal weight participating in the two parts of the study. In one instance they had to remain awake for one night, while in the second instance they slept around eight hours.

A total of 15 men of normal weight participated in the two parts of the study. In one instance they had to remain awake for an entire night, while in the second instance they slept around eight hours. ‘We found that a night with a total lack of sleep was followed by elevated blood concentrations of NSE and S-100B. Blood levels of these substances usually rise after acute brain injury. Consequently, our results indicate that one night of sleep deprivation can increase the risk of a loss of nerve cells,’ says sleep researcher Christian Benedikt, at the Department of Neuroscience.

A group of language researchers from Sweden, Norway, Denmark, Finland and Lithuania started collaborating in 2010 to promote research on swear words in the Nordic languages, a field which has previously been neglected in language research. The collaboration has resulted in the book Swearing in the Nordic Countries. The authors look closely at current and historic use of swear words, attitudes towards swearing in different age groups, swearing in media, as well as how swear words are passed from one language to another.

‘The bad words have linguistic and social functions that we want to understand. Swear words reveal things about us and the society we live in, about our relationships and values, both then and now,’ says Ulla Stroh-Wollin, senior lecturer of Nordic languages at Uppsala University.

In her chapter of the book, Ulla Stroh-Wollin discusses swearing from a historic perspective, based on studies of 45 theatrical plays from the 18th, 19th and 20th centuries. The studies show that before the mid-1700s it was likely worse to ‘take the Lord’s name in vain’ than to use sublexical curses. Ulla Stroh-Wollin has also seen that swearing in general was at its most stigmatised during the late 19th century.

The poor-owned more than believed

RESEARCHERS in economic history at Uppsala University have shown, by studying Swedish auctions during the 1700 and 1800s, that the scale of the Swedish trade has previously been grossly underestimated. They have also seen that poor people owned many more objects than previously thought. ‘It has often been thought that during this period Sweden was a community lacking in objects, but that is not true at all,’ says Sofia Murhenn. Previous research has often looked at inventories, but much of what a person buys in a lifetime disappears before an inventory is made of the dead estate. Researchers have also found that there was a great rotation of belongings.

Sleep can protect the brain

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The history of swearing

‘BAD WORDS’ have always existed. In a new book, a group of researchers from the Nordic countries present the latest research on swearing. How are swear words used and which attitudes have existed towards men’s and women’s swearing? What words did you use if you wanted to say something really foul in the 17th century?

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First dinosaur finds in Saudi Arabia

AN INTERNATIONAL research team has found 72 million year-old dinosaur fossils on the Arabian Peninsula. They have identified a tooth from a carnivorous dinosaur and a tail vertebra from a 20-metre long dinosaur.

These are the first taxonomically identifiable dinosaurs from the Arabian Peninsula that have been reported, says Benjamin Kear, researcher in paleobiology at Uppsala University.

Two different types of dinosaurs can be described based on the fossils, a bipedal carnivore that is distantly related to Tyrannosaurus but only six metres tall, and an herbivorous theropod that may have been up to 20 metres long.

Porridge has health benefits

A DIET BASED on Nordic food has several positive effects, such as lowered cholesterol, blood pressure and improved insulin sensitivity. Some of the cholesterol-lowering effects are related to the improved fat quality in the Nordic diet, and our Nordic breakfast of porridge can have unexpected positive effects. Viola Adamson, doctoral student at the Department of Public Health and Caring Sciences shows this in a new thesis. Switching to a Nordic breakfast of fibre-rich porridge can have positive effects on abdominal fat and inflammation.

Punk is no revolt

PUNK is no subculture arising not as a revolt against injustice, but is created and defined from within, irrespective of how the outside world appears. This is shown in a new thesis by sociologist Erik Hannerz. He has studied how punks in Sweden and Indonesia define their subcultural affiliation, both in relation to the surrounding community and to other punks.

If subcultures such as punk occurred due to injustices in society, we would see significant differences between countries, which we do not. My study shows that it is the same structures and inequalities that occur in punk in Sweden as in Indonesia,” says Erik Hannerz.

Wave power in the Baltic Sea

CONDITIONS ARE GOOD for an investment in the development of wave energy in the Baltic Sea. This is what a two-year EU-funded pilot study shows, which has now been completed. You could say that the study opens up the Baltic Sea for wave energy. There are challenges with seasonal ice, for example, but we have managed two seasons with good results. Our technology has proved to be very well adapted to the Baltic Sea’s wave climate and depth, says Erland Strimstøft, researcher at the Ansgar Laboratory and principal of the study.

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When Uppsala University recruited 39-year-old Erik Ingelsson as professor of molecular epidemiology, there was talk about a spectacular recruitment. After a first year with publications in Nature Genetics and Science and a number of prestigious grants there was no reason to doubt this.

AT 35 YEARS OLD, Erik Ingelsson was named professor at Karolinska Institutet. He had previously taken a doctorate in just over two years and was ranked in 2011 by Business Week in 14th place out of Sweden’s 101 super talents. When Erik Ingelsson’s Alma mater, Uppsala University, managed to recruit him and his research team, Stellan Sandler, dean of the medical faculty, described it as a spectacular recruitment.

‘In my field a great deal speaks for Uppsala University,’ says Erik Ingelsson. ‘The successful tradition within diabetes and cardiovascular research, the flagship Uppsala Clinical Research Center, the establishment of SciLifeLab and ties to the Uppsala University Hospital. Once in place, my research team and I have been very well received and we have had a great initial period with publications in, among others, Nature Genetics and Science.’

ERIK INGELSSON focuses his research on the relationships between molecular factors such as genes, proteins and metabolites, and – primarily – cardiovascular disease and diabetes. These diseases are now also increasing rapidly in poor countries. Through large-scale partnerships across national borders, Erik wishes to help reduce the number of sick and contribute to improved care for patients.

‘Molecular epidemiology is a relatively new field. Good studies require ample, well-characterised materials. Uppsala offers a solid base through, among others, the epidemiological initiative EpiHealth. The need of ample material also accelerates the development of global interaction. My group currently works with players in a number of countries and wants to build a leading research environment here in Uppsala.’

Ambitions are high and, according to Erik Ingelsson perfectly reasonable. For him, it means conducting important studies and innovative research and the horizon is probably not too far away:

‘My group has the ability to apply new technologies in other applications and by doing so continue development. Besides, at Uppsala, we have more of the external conditions required. The challenges I see primarily concern Swedish research in general, such as career paths and funding models.’

AS A MEMBER of Sweden’s young academy, Erik Ingelsson is a clear voice in the research policy discussion. According to the academy’s website it advocates a system characterised by transparency and fairness, however, at the same time primarily rewards the best researchers and research environments.

‘I think we need a structural system change in the Swedish academic world
Erik Ingelsson wants greater focus on researcher-initiated ideas with assessment in open competition.

During high school, I actually considered a career as a musician, and singing in OD is probably as close to becoming professional that an amateur can be.

NATURALLY, THERE IS ANOTHER ITEM on Erik’s research policy agenda concerns the model for research funding. Personally he is looking for greater focus on researcher-initiated ideas with assessment in open competition. However, he is unsure about the current trend with policy-driven initiatives and large collaborations.

‘I’m definitely not questioning the good will of those governing, but there is a risk that many researchers will be forced to set up their activities in a patchwork of different forms of funding. What’s more, I dare to say that if as researchers we do not know what the future holds so probably it’s unlikely that we elected to. This does not mean that the research community should be left alone without evaluation, but important discoveries cannot just be forced to the fore.’

In 2013 he was granted, as one of nine Swedish researchers, the ERC Starting Grant and was also named a Wallenberg Academy Fellow. This success means that Erik’s research team can follow up and deepen their acclaimed findings about how our genetic inheritance affects the risk of developing obesity, lipid disorders and cardiovascular disease.

‘In addition, it increases our ability to invest in new, more daring directions, which makes the research much more enjoyable and it is a privilege I am extremely grateful for. Just having fun has always been a great motivator for me, both professionally and personally.’

A new window on the Universe

Over five thousand optical modules have been lowered into the ice.

Researchers spin threads of gold and DNA

Early violence leaves a mark

ONE IN FIVE ADULT WOMEN in Sweden and one in twenty men have suffered sexual violence at some time in their lives. This is the result of a study from the National Centre for Knowledge on Men’s Violence Against Women (NCK) at Uppsala University. The survey also illustrated a clear link between exposure to violence and physical and mental ill health later in life.

‘Violence is a serious social problem and also a public health problem. It is therefore important to have a current survey as a basis for decisions concerning measures to combat violence and improve support for those affected,’ says Professor Gun Heimer, director of NCK.

The survey was directed to a nationally representative sample of 10,000 women and 10,000 men aged 18–74 years and was conducted in collaboration with Statistics Sweden.

IN BRIEF

A new window on the Universe.

How to combat abdominal fat

NEW RESEARCH from Uppsala University shows that saturated fat is more fattening and gives less muscle gain than polyunsaturated fat. In the study of 39 young, normal-weight adult men and women, extra calories a day for seven weeks. The target was that they should go up three per cent of their original weight. The extra calories were ingested in the form of muffins with a high-fat content, baked in the lab by Fredrik Rosqvist, doctoral student and the study’s first author. Half of the participants were fortunate to eat the excess calories in the form of saturated fat (sunflower oil), while the other half received the excess calories in the form of saturated fat (palm oil).

As the subjects of the study were eating an average of three muffins a day to gain weight we baked over 6,000 muffins. Most of the participants thought it went well, even if they tired of muffins by the end, says Fredrik Rosqvist.
THE SHOAL OF FISH IS THE MODEL in studies of democracy

How do countries develop democracy and economic prosperity? What factors lie behind poverty and segregation?

Sociologists and analysts seek out traditional answers in social sciences and economic theories. However, in his latest research Uppsala mathematician David Sumpter started from the movements of a shoal of fish to create mathematical models for assumptions about democratic development.

Fish move in two or three dimensions, which are a part of a human’s conception of up and down, left and right, says David Sumpter. ‘But countries also move through a number of dimensions, though these comprise of economic growth, democracy, and infant mortality. These movements can be described using the same mathematical methods.’

He has collected the material from research projects at Sydney University in Australia over the past five years. Mathematical models have been based on colleagues’ biology experiments with ants, grasshoppers and fish. The idea for the current study came three years ago. ‘The source of inspiration was Professor Hans Rosling’s Gapminder company and their creative computer simulations of development trends.’

I had developed methods based on a shoal of fish, but somewhere in the background there was always a desire to model humans. I asked myself whether I could use this type of method to other questions to study, for example, development and social behaviour in humans, says David Sumpter.

He contacted Peter Hedstrom at the Institute for Futures Studies in Stockholm, who arranged another partner in the World Value Survey.

THE PROJECT really took off when the World Bank opened its databases as well as the financial support from the Swedish Research Council and the Riksbank. In December, David Sumpter and his colleagues’ research findings were presented in the online publication PLoS One. At the same time, they made a video with moving illustrations of 74 countries’ democratic and economic growth since 1981.

For example, the democratic criteria is not just about whether the country holds democratic elections. The experts who evaluated democracy and human rights in these countries have taken into account many aspects and then gave the countries values between 0 and 1. We then used the mathematical models that corresponded the best with the development pattern, says David Sumpter.

Mainly it is a question of using the countries that have developed democracy in the last 30 years in order to make assumptions about the future for others who find themselves in the same position today.

Interest among politicians is large, and several social projects are in the pipeline.

‘In one project we will try to collect data from Sweden’s municipalities and county councils about the link between mental illness and the background of pupils. In another with Institute for Futures Studies, we will study segregation in schools and residential areas, how it has changed over time and what factors lie behind the changes.’

DATA FROM Statistics Sweden will be delayed however, one reason seems to be limited personnel resources. Another is the ethical component that deals with the distribution of information, and to whom, says David Sumpter. Something he anticipates are reactions to the models and questions about how the results should be interpreted.

‘It is no good if we say that this will happen in five years’ time and it does not happen. Yet if it is foreseeable, then I think the information is interesting and valuable to pass on.’ However, the Lucas critique in economics argues that a model that can predict the future can be used to change the model. Accordingly, there is a risk that we actually change society so that what we predicted does not occur.”

The idea of analysing human social systems based on group behaviour in animals has long interested David Sumpter at the Department of Mathematics. He has previously studied and mathematically formulated how individual animals take after the movement patterns of groups. Yet he and his research colleagues recently published a report in which social movements were described and predicted with the help of differential equations, based on studies of shoals of fish.

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GAME DESIGN
in rapid development

In order to become a good game designer, you need to grasp the latest technology—but also to develop as an artist. A creative environment encompasses the design education in Visby, where a sketchbook and guitar have their given place among the computers.

In one of the houses on Campus Gotland intensive game development is in progress. We open the door slightly to one of the computer halls where some first year students are gathered around a table. They were fully concentrated on their game projects.

Alexander Westerdahl has an electric guitar on his lap. He’s recording sound effects for the game he and his friend Simon Strandh across the table are working on.

We need the sound of a rubbish bin rolling down the hill. The game is about a man who is angry with everyone and everything during a demonstration.

Anders Wetter sitting close by is drawing in his sketchbook. He started playing computer games as a four year old and has already managed to develop his first two games.

I’m working on my own concept while studying too. This happens around the clock,’ he adds smiling.

The others around the table nod knowingly. It often happens that they stay here after the end of day.

‘I spend more time here than at home. And I still go home with a smile every night,’ says Adam Wrange.

The level of applicants to the education in game design at Campus Gotland is high. The computer games industry is an industry of the future in which Sweden is at the forefront, with the most developed games per capita.

‘New technological opportunities emerge every week. Our students must master today’s technology, but above all be equipped for coming technologies,’ says Professor Steven Bachelder.

When the programme started in 2001, it was Sweden’s first higher education programme in game design and one of the first in the world.

Nowadays, the department of game design is a part of Uppsala University, but residing in Visby.

Over the years, the education has garnered a lot of international attention. In May, it’s time for the annual Gotland Game Conference, where an international panel will evaluate the games created by the students.

In 2013, the department participated in the Tokyo Game Show as the first European institution of higher education. Three games developed by students and which won awards in Swedish Game Awards were shown at the stand.

We were the first European university that participated at the Tokyo Game Show and we attracted a great deal of attention.

‘We were the first European university that participated at the Tokyo Game Show and we attracted a great deal of attention. Japanese producers were very interested in the students, we were actually surprised by the actual level of interest,’ says Steven Bachelder.

Here there is an internationally compiled teacher group, which increases the dynamics. Two researchers from Japan come with a total of 50 years experience, from Tokyo Institute of Technology and the research unit at Japan’s national television, (NHK).

‘They help us to make the connection between research in new technologies and games. We need to prepare the students for the future, so that they are used to implementing their ideas with new techniques. Otherwise it will be difficult for them to assert themselves.’

The students learn how to master the techniques, but above all to find new artistic forms.

They must excel at the technology, but technology cannot be an end in itself; it is just a tool. The technical development is tangible and affects the whole environment, but really they should not think about technology more than an author thinks about his language. That’s the challenge.

One of the teachers is Marcus Ingvarsson. He studied here himself from 2005 onwards. He then worked for a number of years in Germany at a large games company. When a teacher vacancy arose in Visby, he moved back.

What should a good game designer be capable of?

‘You should be open to the ideas of others and have the discipline to complete them. It is a mistake to distinguish between “my idea” and “your idea”. Everyone has good ideas, but a good idea fails with poor implementation. It’s not about ideas but about implementation.’

And to learn how to develop good game design you need to test, test and test again.

‘It has never been easier than today to try to develop a game, just get started! Many programs are free. Above all, you have to stop thinking and start developing. There are no obstacles or excuses anymore.’

The students develop many games during the course of the education, on an increasingly advanced level. A number also spend their leisure time on game projects and some of the games...
Games do things that other forms of media do not do. My question was: What’s the difference?

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Games do things that other forms of media do not do. What’s the difference? And what is the potential, with the development taking place? It was so interesting that I committed here from Stockholm for seven years. Eventually I moved here. I still haven’t answered the question, so I’m still here,’ says Steven Bachelder with expectant expression.

Here at Campus Gotland, he can follow developments first hand. ■

New programmes:

Several new programmes will start at Uppsala University next academic year.

Among the new programmes is a unique bachelor’s programme in musicology:

IT IS THE ONLY bachelor’s programme of this kind in Sweden,” says Malin Sjögren, faculty programme director at the Faculty of Arts.

The programme includes courses in sight-reading, partner-reading, harmony, counterpoint, ear training and music analysis.

Students will not only study theories, but they will work with the music. These are skills that are in demand and are presupposed by professionals internationally,” says Malin Sjögren.

The program runs for three years and is given in Uppsala.

In the autumn 2014 a new bachelor’s programme will start in environmental science at Campus Gotland.

‘Environmental science issues are included in many other programmes, but getting a holistic view of environmental science is something new,’ says Björn Gembert, faculty programme director at the Faculty of Natural Sciences.

The programme has an interdisciplinary focus on natural resource management. ■

New Education

New programmes: physiotherapy programme and bachelor programmes in musicology, environmental science, business administration, leadership-quality-improvement, archeology and ancient history, as well as bachelor of Science in Engineering programmes in quality development and leadership.

On the pulled down projection screen is a snooze alarm for mobile phones.

Tired of not being able to decide the length of their extra nap, the young students have made an alarm that is activated after two minutes. A course in application development is in progress here with students both in front and behind the lecturer’s desk.

SIXTEEN GUYS have gathered for the course, app development for smartphones with Hampus Iggström and Shervin Shora-

vi from the Master of Science Programme in Information Technology. The idea came to the two students two years ago.

We thought it would be fun if we got started and tested a load of things over a weekend. The programme gives us all the theory we need, but there is not enough time for practical exercises,’ says Hampus Shervin.

If you want to be good at app development you must be prepared to sit for eighty hours a month outside of the education.
“Psychologists are needed!”

Kajsa Asplund has studied the psychology programme, and during her study days helped to develop the job fair Psychology Day Uppsala. She is also a consultant at Psykologifabriken AB and has worked voluntarily for the Red Cross.

How did you come to launch the job fair Psychology Day?

‘After studying the psychology programme for some time, I realised that there were a lot of areas where psychologists were needed but where there were currently none. Some fellow students and I wanted to broaden the image of what psychologists are and what they can bring to the table. But we also discovered that there were no contact points where psychologists and potential employers could meet. At the same time, the department wanted a labour market event, so they were very supportive.’

‘So we set-up an association called Psychology Day, with an aim to arrange an annual job fair, including an exhibition, lectures and individual talks between psychologists and students. And of course a party!’

What will you do after you have qualified?

‘I’ll start researching at the Stockholm School of Economics. The project is about talent and how Swedish employers look for talent. There is a great deal of talk that talent is in short supply. But what actually is it? What do companies do to determine who has talent and who does not? Our assessment of people is not an objective process. We all carry a lot of luggage, which affects our judgment. And how, for example, do we relate talent compared to loyalty?’

‘Nowadays clinical psychology stands on a much firmer ground than earlier. The management culture should now be next. In Sweden, no one is currently researching this within psychology. So it is also a way of broadening the subject of psychology.’

In the autumn, you were “Uppsala Student of the Year”. What do you intend to do with the money?

‘It was fantastic and unexpected to receive the scholarship! I feel very honoured. It’s not just the money, as gaining access to the Anders Wall network is worth just as much.

It’s a melting pot of artists, musicians, entrepreneurs, researchers and others. It’s an incredibly creative group.’

‘The money will be spent on the development of a stress programme for middle management that was the basis of my thesis.’

Where do you get your drive?

‘I think my enthusiasm comes from being extremely curious! I want to know, both teach myself and pass knowledge on to others. My studies have benefitted by everything being so stimulating. I’ve probably got this from home. Mum was much the same.’

The project is about talent and how Swedish employers look for talent. There is a great deal of talk that talent is in short supply.
The instrument that finds pathogens

If doctors can be told quickly exactly which microorganism infects a patient and which antibiotics will work the likelihood of quick and effective treatment increases. The risk of resistant strains developing also decreases. The Uppsala based company Q-linea are currently developing an instrument that will do just that.

They developed a prototype to find the spores and within the framework of a EU project, it was possible to test it in a live environment. The choice fell on the Prague Metro. Where a large number of people are on the move and trainns push the air back and forth in the underground facilities.

“Our prototype was actually the only instrument that passed all the tests,” says Jonas Jarvius, not without pride. “It was great to see that the instrument actually managed to measure in such a complex mix. It was the first time it had been shown around the world at all.”

THEY ALSO had contact with the major French company Thales Security Systems, who on behalf of the French government were engaged to develop a method to measure contamination in air.

“So we got a contract with them, as the only non-French company! We were actually head-hunted,” says Jonas Jarvius and smiles.

Meanwhile, they had come to the conclusion that health care would benefit the most from their technology. The technology could, for example, be used to make quick analyses so that doctors were able to prescribe the correct antibiotics, for example, to people with sepsis, acute septicemia.

Through being able to quickly determine exactly what bacteria is causing the infection and moreover find out which antibiotics are effective, doctors can provide the correct treatment much earlier than current technologies. For a patient with sepsis, mortality increases by about seven per cent for every hour that they receive the wrong treatment, so it is very important to be fast.

Other potential uses are for patients suffering from a urinary tract infection. He hopes that the instrument can be found in our hospitals within a few years.

THE COMPANY has now grown to 23 employees and spans the entire production chain from microbiologists and molecular biologists to circuit board builders, software designers, mechanics and carbon fibre moulders. They have also taken on young researchers, who have often started by doing a thesis and then continue to work at the company.

Q-linea now has a long-term collaboration with Bengt Ågerup’s venture capital company nxt2b. The company has had continuous funding from the Armed Forces via Thales and now to nxt2b. Without it, Jonas Jarvius is convinced that Q-linea would not be the company it is today.

‘If we had had to look for money in the same way as many other start-ups it would have been much more difficult to grow. This is a huge problem for all small, newly started spin-off companies.’

Caption: Jonas Jarvius publicly defends his doctoral thesis.

The company has received funding from the Swedish Armed Forces.
Government employees – LOOK HERE!

Last year, the University of Uppsala took over responsibility for web-based further education for government employees. This now means the university educates more public employees than any other provider.

What do you think?

New forces are reshaping society. Why it is important with continuing professional development and what they hope Uppsala University can contribute.

Ulla Peterson Immuni, communicator and coordinator at the Migration Board:

‘At work you are usually busy with your duties and may not have time to keep abreast of everything that happens. Therefore continuing professional development is necessary for us as an agency to maintain our level of expertise.’

‘It is particularly interesting to listen to the researchers, to get a perspective from people who have studied our issues from a different perspective than we do. At the same time, the university must think about how they intend to reach out to the agencies in a good way.’

Gert Lundblad, information developer at Försäkringskassan:

‘Basic and continuing professional development are essential for good operations. Without it you are groping in the dark. Försäkringskassan is fairly new as a public agency, so there is still much to do when it comes to talking about how it is to be one of 240,000 civil servants.’

‘It is of great value that we can be involved in the whole process when the courses are developed and given. I think our work with Uppsala University will be successful.’

Eva Olovsson, works with plain language at the Swedish Language Council:

‘Further training is very important in order to develop in one’s profession, and not stagnate. We are many linguists, and perhaps many of us do not see ourselves as public servants. So it is good that there are training courses that as a public servant one is obliged to do and not should do.’

‘Uppsala University is an unknown when it comes to these courses. However, for those of us who are punters and linguists, it sounds good, as we still have a lot of contacts with the academic world. I hope we can work together to develop joint training courses.’

Increasing grants

NUMEROUS POSITIVE trends can be seen in the latest annual report from the University of Uppsala. Turndown during the past four years has increased by 17 per cent. An important milestone in 2013 has been the establishment of SciLifeLab with nodes in Uppsala and Stockholm, as a national centre for research in the life sciences.

The focus on increased EU research funding has yielded a good result. Among others, more young researchers received funding from the EU and the Swedish Foundation for Strategic Research programme “Future Research Leaders”.

‘These are good signs seen from a future perspective and show that Uppsala University’s researchers and research stands up well against the competition. Another positive development is that we have become better at quickly putting research funding to work, among others, through new recruitment,’ says Vice-Chancellor Eva Åkesson. Applicants per University place continues to rise, and third stream activities have been intensified during 2013. Innovation activity has initiated several new collaborations and contract education continues to increase.

“The age rich are a resource”

SOCIETY MUST SEE “age rich” (elderly) people as a valuable resource, not as a burden,” says Barbro Westerholm who will participate in the Uppsala Health Summit on 3–4 June. The theme of this international meeting is “Health Care for Healthy Ageing”.

Barbro Westerholm is member of parliament for the Liberal Party, physician and researcher. She was Director General of the National Board of Health and Welfare 1978–1985 and chair of the Swedish Association for Senior Citizens 1999–2005.

What is the position of Sweden, from a European perspective, regarding health care for the elderly?

‘From the studies I have seen and of the reactions I met at international conferences, I would say it is good. The fact that half of all people with dementia receive care and attention around the clock, surprises representatives from many other EU countries. In other words, we have it good in Sweden, but need to get better because there are flaws.

She believes questions relating to the health of the elderly should receive more attention outside of health and social care. "Health is not only won in the health sector, other sectors of society must become involved.”

What are your expectations for the Uppsala Health Summit?

‘That prominence is given to knowledge which shows age rich people are a valuable resource and that the feeling of being needed is important to one’s health.”

ANNA HULTH

Platform for new antibiotics

UPPSALA UNIVERSITY is a leading party in a giant project funded by the Innovative Medicines Initiative (IMI) where academia, the pharmaceutical and biotechnology industries together shall accelerate development of new antibiotics.

‘Such a demonstration of strength with the aim of developing an entirely new family of antibiotics is unique. The initiative represents something that up until now has been missing: funding to collaboratively develop new pharmaceuticals that are so dearly needed to tackle infectious diseases in the future,’ says Anders Karlen, one of two scientific coordinators in the project.

Uppsala University has a central role in the pharmaceutical platform that will take a number of molecules through the entire development chain and hopefully arrive at a new medicine candidate being tested on humans. The six-year project is called ENABLE (European Network for Antibacterial Engine) and has funding of more than SEK 750 million.

The consortium comprises a total of 32 partners that includes universities, biotech industry and pharmaceutical companies. A significant part of the operations will be conducted at Uppsala University.

IN BRIEF

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IN BRIEF

Research funding from the EU has increased.
He wants to redraw the map

‘I do not care what people do with the knowledge, but we all need to learn the very basics about the state of the world if we are to live in it. Today, most people have an image that better matches Tintin’s reality. Meet Hans Rosling, honorary doctor who wishes to show us our new world.

‘I'M NOT GIVING ANY PERSONAL PORTRAITS, OKAY! Few journalists ask me about the world, but since I became a celebrity, all everyone wants is personal portraits. The media is ineffective as a learning tool if the focus is on the teacher.’

Hans Rosling has obviously had enough of his role as the Swedish academic world’s cover boy. But do not mistake frustration for resignation. The coffee splashes when perhaps the foremost educator of our time bangs his fist on the table. The fact he will soon step onto the stage in the great hall as an honorary doctor at his Alma mater, Uppsala University, is nothing that dampens the joy of working, on the contrary.

‘The title does not include the right to work at Uppsala University, but I’m thinking positive and interpreting it as compensation for the fact I never had the chance to compete for a job in Uppsala. Instead, I had to commute to Solna for 20 years.’

HANS ROSLING TOOK has medical degree 1975 at Uppsala University. The profession took him and his wife Agneta to Mozambique, where, side-by-side, they discover Konzo the paralytic disease that affects the rural poor and later formed the basis of Hans’ doctoral studies.

Back in Sweden, Hans Rosling takes the initiative to the Sweden section of Doctors Without Borders and starts the course Man and Nature at Uppsala University. In 1997 he moved his desktop to the Karolinska Institutet and the post of professor. Eight years later, together with his son Ola and daughter in law Anna, he founded Gapminder, a foundation that develops the Trendalyzer software with the aim to illustrate statistical development over time.

‘We can no longer divide the world into only two types of countries: developed and developing countries. Today the vast majority of nations find themselves in the socio-economic mainstream, with the richest and poorest people on each side. However, the improvements occur faster than we Swedes update ourselves. Gapminder and Novus recently tested the public’s knowledge of the percentage of vaccinated children, illiterate adults and number of children per woman. The answers are more like Tintin’s reality than our own and the results are often worse than chance. The problem is not a lack of knowledge, but an actively enforced ignorance.’

GAPMINDER WILL SOON begin to produce and distribute information about our planet. The impact is huge. In 2012, TIME magazine voted Hans Rosling as one of the world’s 100 most influential people. The day before our meeting, IT billionaire Bill Gates praised Hans to the skies. There seems to be only one person who was not impressed: Hans Rosling.

‘The aim was never fame. The aim has been to increase the general public’s fundamental knowledge about the state of the world and which up until now is something Gapminder has failed to do. And as long as everyone, from professors to high school students, live in ignorance about these major changes, I’ll continue with my work. Gapminder has recently started to develop apps that will incorporate specific themes about countries, regions and the world. Some days ago we published a video showing how a reduction in infant mortality controls population growth, look here and you’ll see’

SUDDENLY HANS draws a few rapid lines in my notepad, to show that the number of children on earth has already stopped increasing and that rapid population growth has ceased during this century. Guided by Hans Rosling’s equally characteristic as absorbing explanations, I’m soon convinced, this may fix the world! However, it strikes me suddenly, what do I actually do with my newfound knowledge?

I don’t care’, grins Hans. The person who created the underground map in London did this so travellers would understand the system, he didn’t care where they were travelling. I’ll give you a map of the world. How you use it is your own business, but in my world, knowledge is the foundation of any well-functioning society, business and democracy.’

The person who created the underground map in London did this so travellers would understand the system, he didn’t care where they were travelling.
NEW HORIZONS: ISSUE 1.2014

4 QUESTIONS

Johan Ståhl studied economics and marketing for three years at Uppsala University. He then became a full-time magician and has performed throughout the world. He treated Uppsala to a magic and humour festival of world class – Uppsala Magic and Comedy, in April.

“Magic happens in the heads of the audience.”

“I HAVE WORKED” for twelve years as a magician and during the last six years I have performed a great deal abroad at conferences, festivals and shows. I wanted to bring this home to Sweden and to my hometown of Uppsala. It was absolutely world class, I have been inspired by the top venues in the world,” says Johan Ståhl.

Can you give us some examples?

“We had a unique show with a guy from Chile who performs magic for the blind. Magic is otherwise mostly associated with sight, but here everyone gets a blindfold and a box by their legs. The magician then tells the audience to feel in the box and the magic then takes place in their hands!”

“There was also a chance to see the reigning world champion from South Korea and a stand-up comedian from the comedy series Seinfeldt and friends is just what the members of the Heimat Choir and the Academic Orchestra are. They met in the autumn when the chapel made a highly acclaimed tour to Kyoto, Japan. The music performed at the concerts was a mixture of mainly Scandinavian and Japanese music, with music from e.g. Madame Butterfly (Puccini), European premiers of The Light is Here (Kinosaita) and Spring Night (Shinkumaw) in Japanese: Uppsala University’s dramatic choir also participated.

For my part, it all started when a childhood friend taught me how to make a five kronor coin disappear.

“I have to read books, go to conferences and try things out on colleagues. Then you see whether the trick works on an audience. Magic happens in the heads of the audience not in the hands. Everything is based on how the audience perceives what is happening.”

Any highlights during your career?

“I won first prize in Las Vegas and I have a standing invitation at the Magic Castle Hotel in Hollywood. I can go there whenever I want and perform and that tends to be once a year. In total I’ve done 122 performances there.”

“Last autumn, I ended up on the cover of the world’s first magic magazine, it’s a bit like being in National Geographic.”

Have you benefited from your studies in economics and marketing?

“Absolutely! It’s nothing I have directly worked with, I’ve never been an economist, but it is something that I can implement every day in my profession life. Above all it’s perhaps the academic, critical thinking that helps me to get structure in large projects such as this.”

ANNICA HULTH

Plants becomes art in Botan

THE THUNBERG’S ORANGERY in the botanical gardens will be filled with flower installations during the summer. Seven invited Japanese artists will create the works on site in June. The exhibition is unique in the world as the traditional Ikebana from the prestigious schools Ikenobo and Ohara will be shown together alongside contemporary Japanese art inspired by the plant world’s diversity. Plants from the Swedish countryside and Linnaean Gardens of Uppsala will be combined with cut flowers, planted plants, rocks, roots and branches. The exhibition is open 14 June to 14 September.

The donor and librarian Greta Renborg on assignment in Iowa in 1953.

Lift for personal archives

THE PAIR Greta and Ulf Renborg have bequeathed SEK 12.5 million to the Uppsala University Library. The newly created “Greta Renborg fund” will be used for special investments in personal archives at the manuscript and music unit. Greta Renborg was a colourful librarian and debater. Her fund will have great importance for the knowledge and use of personal historical collections through a service that Greta Renborg the librarian set up with the task of working with the personal archives, both in Uppsala and nationally.

Visit Bergman

UPPSALA UNIVERSITY Campus Gotland has initiated educational and research collaboration with the Bergman Estate on Faro. The aim is to develop new programmes and to stimulate new research collaborations related to aesthetics, film, art, literature, and theories of interpretation.

“We are very grateful for their collaboration with us, which has been very successful,” says Film Director at Campus Gotland.

“The foundation, which manages Inge- mar Bergman’s cinematic ‘home environment’, the so-called Faro environment, has sought a collaboration to create a sustainable environment for artists and researchers. Through this collaboration, the properties will be made available for seminars, courses, and for researchers. The foundation will also make Bergman’s library and its knowledge available to the research developed through the collaboration.”

THE CHOIR Heimat Choir from Kyoto University visited Uppsala and Stockholm in March. The name of the concert was Nakuma, which means friend in Japanese; and friends is just what the members of the Heimat Choir and the Academic Orchestra are. They met in the autumn when the chapel made a highly acclaimed tour to Kyoto, Japan. The music performed at the concerts was a mixture of mainly Scandinavian and Japanese music, with music from e.g. Madame Butterfly (Puccini), European premiers of The Light is Here (Kinosaita) and Spring Night (Shinkumaw) in Japanese: Uppsala University’s dramatic choir also participated.

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NEW HORIZONS: ISSUE 1.2014

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WE ARE CURRENTLY rebuilding the Evolution museum’s premises on Villavägen. In the summer the Museum Gustanavium will move in here with pots from Asine, helmets from boat graves in Valsgärde, mummies from Egypt and of course an exquisite needle-made lace that belonged to the wonderful Augsburg art cabinet.

Uppsala University has truly amazing collections. There are hundreds of thousands of artefacts from various eras and cultures, such as Uppsala’s own modern history of science. We have exhibited a small part in our own museums – the Museum of Evolution, Gustanavium and Carolina. In the university hall you can visit our own fantastic coin collection, and at the castle, we show parts of our art collection, the second largest collection of early modern art in Sweden (only the National Museum has a larger collection).

As a historian, it is obvious that in all subjects and disciplines we need to understand how the past influences what we think and do today. In this way, the objects in the collections are a link to the scientific development at the University. Now that the objects are being moved to a central location in the town this means that the University’s collections can be used as an infrastructural resource for education and research.

Gustanavium has collaborated with teachers from different disciplinary research domains in the past, and for subjects such as archaeology and art history the collections lie a little closer than for many others. However, for the vast majority of researchers, teachers and students at our university, this resource is unknown. Used correctly, the material cultural heritage can give unexpected interdisciplinary links. For example, it may be when advanced materials technology research becomes a resource for conservation, as in the project concerning the ship Vasa’s support cradle, or when DNA analysis of archaeological materials result in new insights about movement patterns and family structure of ancient humans.

We will open the collections again in autumn 2014, so that teachers and researchers at the university can discover new ways to work together with us. Welcome!